

NATURAL HAZARDS Observer

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The National Academy of Science's Joseph Henry Press has announced the publication of the final two volumes resulting from a multiyear project—the National Science Foundation-sponsored Second U.S. Assessment of Research and Applications for Natural Hazards. That study, a reassessment of the findings of a similar study conducted 25 years ago, involved more than 100 hazards researchers and addressed the fundamental question: "Why, despite all our knowledge about the causes of, consequences from, and remedies for disasters, do losses continue to rise?" In this issue of the *Observer*, we present the viewpoints of Kathleen Tierney, author (along with Michael K. Lindell and Ronald W. Perry) of *Facing the Unexpected: Disaster Preparedness and Response in the United States* and Susan Cutter, editor of *American Hazardscape: The Regionalization of Hazards and Disasters*.

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Trends in Research and Disaster Management in the United States

—an invited comment

When the field of disaster research emerged in the late 1940s and early 1950s, studies focused first on the ways in which communities, organizations, and individuals responded to disasters. In those studies, which typically involved postimpact field work in disaster-stricken communities, researchers addressed such questions as whether panic is a common response when disasters strike, whether community residents are demoralized and unable to respond appropriately in the aftermath of disaster, and whether and

under what circumstances organizations and groups cope effectively with the extraordinary challenges disasters present. Many findings from those early studies have endured—for example, that disasters generate an outpouring of altruistic behavior rather than antisocial responses; that rather than declining, community morale actually increases following disasters; and that most individuals behave rationally and adaptively in emergency situations. Many of the insights derived from the first two decades of disaster

research are summarized in reports published in the 1950s by the National Academy of Sciences, books such as Barton's *Communities in Disaster: A Sociological Analysis of Collective Stress Situations* (1969) and Dynes's *Organized Behavior in Disaster* (1970), and monographs produced as part of the first Assessment of Research on Natural Hazards (see the *Observer*, Vol. XXIII, No. 4, p. 3), such as *Human Systems in Extreme Environments* by Mileti, Drabek, and Haas (1975).

Since those early days, research in the disaster and hazards field has expanded to address many new issues and topics spanning the entire hazards cycle, from predisaster mitigation through preparedness, response, and recovery. Researchers have investigated disaster- and hazard-related topics at different levels of analysis, ranging from individuals and households to informally organized groups, communities, various governmental organizations, and multi-organizational networks. As research activities have continued, other important synthesis volumes have been produced, such as *Human System Responses to Disaster*, Drabek's 1986 compilation of disaster-related research findings.

The Second Assessment of Research on Natural Hazards provided another opportunity to survey the disaster and hazards literature and to evaluate what we now know and what we still need to know about the social, economic, and policy aspects of disasters and hazards, including, importantly, research on disaster preparedness and response. Through the work of the Second Assessment, we now have a much better grasp not only of the very significant progress that has been made in understanding the societal issues associated with preparedness and response, but also of gaps in the literature and new questions posed by recent research findings. Additionally, the framework provided by the assessment, which highlights the societal sources of disaster vulnerability and links disaster management to larger issues of sustainability, provides a new lens through which to view disaster preparedness and response.

One assessment theme that weaves together many recent research findings centers on the importance of population diversity and social inequality in understanding disaster preparedness and response behavior. Which households prepare for disasters and which preparedness measures they are likely to adopt, for example, can be explained at least in part by social status-related variables such as income and education. When warnings are issued and people are told to undertake self-protective actions such as evacuation, what they hear and when, how much of the warning they actually understand, whether they decide to act on the warning and how long it takes to make that decision, and what they ultimately do—for example, where they seek emergency shelter—are all shaped by socioeconomic and sociocultural factors such as household resources, family size, ethnicity, and familiarity with the English language. After disasters strike, these same factors also influence access to post-disaster aid and patterns of short-term and longer-term housing. One clear lesson from the Second Assessment is that in an increasingly diverse society, actions that are undertaken to reduce disaster losses must be based on an understanding of the interplay between hazards, the built environment, and socially structured vulnerability.

Newer research continues to support much of what was already known about how groups and organizations respond in disasters. For example, researchers continue to document phenomena such as mass convergence, the involvement of disaster volunteers and emergent groups, and the mass donation of goods, all of which present both challenges and opportunities for those attempting to manage crisis situations. With the advent of global communications systems, the media explosion, and the Internet, these patterns are certain to intensify in future disasters. Other studies reviewed by the Second Assessment point to new topics that need further investigation. These new areas include the manner in which private-sector organizations prepare and respond, the ways in which gender and cultural differences shape both disaster vulnerability and preparedness and response behavior, and the ways in which the technology revolution influences our strategies for managing emergencies.

The period covered by the Second Assessment has also been marked by scholarly debates on a variety of topics. Researchers continue to differ in their views on how to define disasters and measure their impacts. They also question whether, by characterizing disaster behavior as overwhelmingly altruistic, earlier studies may actually have downplayed the extent to which disasters are also characterized by conflict. Other debates center on the question of whether natural and technological disasters differ in their individual and community effects and on how much additional safety new technologies can provide. Research has answered many questions but has also raised new ones: Are images of disaster behavior developed on the basis of U.S. research equally valid for other societies? Do new technologies actually make our societies safer? Is vulnerability increasing despite technological improvements, and if so, why? How much can technology help in crisis situations, and under what circumstances?

One of the most significant trends affecting disaster preparedness and response is the transformation that has occurred in disaster management since the first assessment. Once focused equally on war readiness and planning for disasters and viewed as the exclusive purview of individuals with military backgrounds, "civil defense" has evolved into the profession of emergency management—a profession that requires diverse skills, ranging from the ability to develop formal disaster plans, to skills in community outreach and organizational development, the ability to mobilize political constituencies, and knowledge of new and emerging technologies. The professionalization of the field has been accompanied by the development of new organizations, specialty fields, and credentialing processes, as well as the growth of college and university curricula focusing on principles of emergency management. With this ongoing evolution in disaster management, disaster research must continue to document how and why disasters occur as well as their immediate and long-term impacts.

Kathleen Tierney
Disaster Research Center
University of Delaware



The Geography of Hazard Events and Losses

—an invited comment

More than a half century ago, Gilbert White's early floodplain studies surveyed the human occupancy of hazard zones and sought to identify the full range of adjustments that individuals and society could make in response to hazards. In the ensuing 50 years, much has changed (technology, the density of development, and the understanding of physical processes), yet we are still stifled by incomplete knowledge regarding the risks and vulnerabilities of specific locations to hazards. Are some places more disaster-prone than others and if so, why? Are we exposed to more hazards now than in the past based on an actual increase in the number and severity of hazard events? Is our vulnerability to hazards simply increasing due to population movements into hazardous locations? Or is it some combination of the two?

There has been a tendency within the hazards community to examine these questions historically but not geographically. The geographic dimensions of hazards—where they occur, why they occur there, who is most at risk, and which places are most vulnerable—provide a much-needed baseline for monitoring the effectiveness of many of our public policies targeted at hazard reduction and disaster-resistance.

American Hazardscapes: The Regionalization of Hazards and Disasters examines geographic variability in hazard events and losses for the past 24 years by state for the entire country. The first half of the book provides an overview of methods, techniques, and innovations in vulnerability and hazards assessment and improvements in

the mapping sciences. This is followed by an extensive discussion regarding hazard event and loss data, notably data availability, quality, and usefulness. The remaining chapters describe state-level temporal and spatial trends in events and losses during the past 24 years, culminating in recommendations for reducing future hazard losses.

Two findings are especially relevant in understanding the geography of hazards, findings also highlighted in *Disasters by Design* (Mileti, 1999). First, there is no systematic accounting of losses by location and by specific hazard for the nation, let alone an integrated, or all-hazards, database of such losses. We have fragmented and incomplete data on hazard events and losses collected by a myriad of state and federal agencies, the private sector, and academics, but we do not really know the full extent of losses from hazards and disasters, nor the true costs of rescue, relief, and recovery efforts in response to them at the national, state, or local levels. Some suggest that disasters make good business, but a full cost accounting of hazard events and disasters for the nation has not been undertaken. The United States must systematically collect, analyze, and store standardized, geo-referenced data on losses and costs (current and past) so we can establish a baseline to monitor the effectiveness of hazard mitigation programs and hazards reduction policies at local, state, and federal levels. The compilation and maintenance of a national geographically referenced inventory of hazard events and losses is one of the most critical needs facing the country. In fact, a National Loss Inventory

Natural Hazard Events Clearinghouse would serve as a data archive and repository for such data and assist in their dissemination to decision makers, practitioners, researchers, and the public.

Second, vulnerability science is still in its infancy, and there is no standardized technique for determining the vulnerability of a place (and the people who live there) from multiple hazards. We need to know the interactions between natural, social, and constructed systems and how these increase or decrease local vulnerability to hazards. At present, we lack the necessary research capacity to fully implement a national-level hazard and risk assessment for all hazards. We lack consistent and comparable data on exposure or risk indicators across all hazards. The same is true for the indicators of social vulnerability. Our science is not sufficiently developed that we can adequately model, let

alone predict, future risk exposures or social vulnerabilities. Getting this knowledge to the local level poses yet another challenge.

There were, are, and will be inequities in the patterns of hazard events and losses. These inequities will widen in the foreseeable future and may require substantial resources in some places or for some social groups in order to lessen their vulnerability to environmental threats. Geography and the geographer's perspective will be just as vital to the nation's understanding of hazards in the future as it was during the past half century.

Susan L. Cutter
Hazards Research Lab
Department of Geography
University of South Carolina

Books from the Second Assessment

The two new volumes from the Second Assessment are:

- *Facing the Unexpected: Disaster Preparedness and Response in the United States*, by Kathleen J. Tierney, Michael K. Lindell, and Ronald W. Perry (2001, 300 pp.). *Facing the Unexpected* presents a wealth of information derived from disasters that have occurred around the world over the past 25 years. The authors explore how these findings can improve disaster programs, identify remaining research needs, and discuss disasters within the broader context of sustainable development. Focusing on social, cultural, and economic factors that shape vulnerability to disasters, they examine key questions regarding today's catastrophes and review the influences that have shaped the U.S. system for disaster planning and response at all levels. They also compare technological and natural disasters and examine the impact of technology on disaster programs.
- *American Hazardscapes: The Regionalization of Hazards and Disasters*, edited by Susan L. Cutter (2001, 250 pp.). *American Hazardscapes* examines the risks associated with living and owning property in diverse regions across the United States and offers dual perspectives: that of the geographer and that of the social science hazards researcher. Well-illustrated with numerous maps and figures, the book summarizes what we already know about regional patterns of hazards events and losses during the previous three decades and goes further to shed light on the nature of the events themselves and their impact on society.

The other volumes resulting from that study include:

- *Disasters by Design: A Reassessment of Natural Hazards in the United States*, by Dennis Mileti (1999, 376 pp.). *Disasters by Design* is a summary of the project's overall findings. The book reviews hazards research of the last two decades, synthesizes

what has been learned, and outlines a proposed shift in direction in research and policy for natural and related technological hazards in the United States.

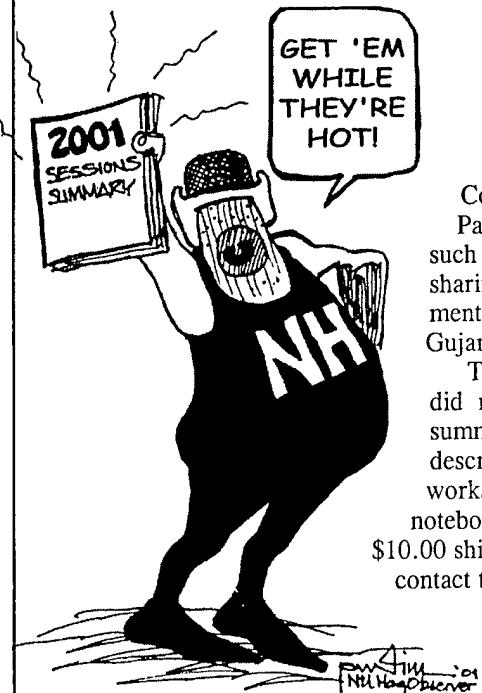
- *Cooperating With Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*, edited by Raymond J. Burby (1998, 368 pp.).
- *Paying the Price: The Status and Role of Insurance Against Natural Disasters in the United States*, edited by Howard Kunreuther and Richard J. Roth, Sr. (1998, 320 pp.).

Each of these books is available for \$47.95 (significant discounts are available for orders placed via the web), plus shipping and handling. To place an order, contact the *National Academy Press, 2101 Constitution Avenue, N.W., Lockbox 285, Washington, DC 20055; (888) 624-7645 or (202) 334-3313; fax: (202) 334-2451; WWW: www.nap.edu*.

Information about each volume is available from the NAS publication web site. Indeed, each can be read in its entirety on-line. The web addresses for each volume are:

- *Disasters by Design*: books.nap.edu/catalog/5782.html
- *Paying the Price*: books.nap.edu/catalog/5784.html
- *Cooperating with Nature*: books.nap.edu/catalog/5785.html
- *Facing the Unexpected*: books.nap.edu/catalog/9834.html
- *American Hazardscapes*: books.nap.edu/catalog/10132.html

Finally, a complete, extended bibliography for *Disasters by Design* is available from the Natural Hazards Center web site: www.colorado.edu/hazards/assessbib.html. This list of references comprises all the citations provided by the many researchers, practitioners, reviewers, and other individuals who contributed to the Second Assessment.



2001 Session Summaries Now Available

In July, hazards professionals from around the world gathered in Boulder, Colorado, for the 26th Annual Hazards Research and Applications Workshop.

Participants at this gathering focused on cutting edge hazards issues, tackling such topics as changes in hazards management in the 21st century, bioterrorism, sharing information world-wide, the evolving profession of emergency management, balancing the environment and the economy in hazard mitigation, and the Gujarat earthquake in India.

To ensure that the ideas and discussions generated are shared with those who did not attend the workshop, the Natural Hazards Center publishes brief summaries of each session, abstracts of the hazards research presented, and descriptions of the projects and programs discussed at the meeting. A set of all workshop materials, including the agenda, participant list, and workshop notebook, costs \$25.00, plus \$6.00 shipping for domestic orders; \$25.00, plus \$10.00 shipping for orders outside the U.S. (For more detailed ordering information, contact the *Publications Administrator* at the address below).

Currently, the list of all session summaries is available on-line at www.colorado.edu/hazards/ss/ss.html. In November, the complete text of all session summaries will also be available at that site, although abstracts of hazards research, programs, and projects will not.

To order these materials, send your payment (checks should be payable to the University of Colorado) to the *Publications Administrator, Natural Hazards Research and Applications Information Center, 482 UCB, University of Colorado, Boulder, CO 80309-0482; (303) 492-6819; fax: (303) 492-2151; e-mail: janet.kroeckel@colorado.edu; WWW: www.colorado.edu/hazards*. Visa, Mastercard, American Express, and Diner's Club cards are also accepted.

Now available on the web

Hurricanes and Politics in Latin America Redux

In the previous *Observer* (Vol. XXV, No. 6, p. 5), we announced the availability of the Hazard Center's Special Publication 38, *The Storms of '98: Hurricanes Georges and Mitch—Impacts, Institutional Response, and Disaster Politics in Three Countries*, by Richard Olson, Ricardo Alvarez, Bruce Baird, Amelia Estrada, Vincent Gawronski, and Juan Pablo Sarmiento Prieto. That work examines the response and "disaster politics" (including media coverage) associated with Hurricane Georges in the Dominican Republic and Hurricane Mitch in Honduras and Nicaragua. The focus is the "marginalization" of national emergency response agencies. These organizations—typically small national civil defense offices—were quickly shouldered aside when the disasters became major catastrophes demanding international attention and aid. New, temporary offices were established, with consequent duplication of effort, lack of coordination, and poor response.

To deal with this difficulty, Olson and his colleagues offer their "accordion option" under which a national

emergency organization recognizes its probable marginalization and therefore prepares a plan for the head of state that outlines how national-level disaster response can be expanded to include other ministries and organizations, while the emergency management office itself retains an organizing and coordinating role.

To make this important work available as widely as possible, *The Storms of '98* (67 pp.) is now posted on the Hazard Center's web site at www.colorado.edu/hazards/sp/sp.html, where it can be read and/or downloaded for free.

Persons desiring a printed copy can still purchase *The Storms of '98* for \$20.00, plus shipping (\$5.00, U.S.; \$8.00, Canada; \$12.00, Mexico; \$18.00, beyond North America) from the *Publications Administrator, Natural Hazards Research and Applications Information Center, University of Colorado, 482 UCB, Boulder, CO 80309-0482; (303) 492-6819; fax: (303) 492-2151; e-mail: janet.kroeckel@colorado.edu*.

An Invitation to Join

The Natural Hazards Center's Quick Response Program

Are you interested in studying a disaster within hours or days of the event? If so, here's an opportunity for you. The Natural Hazards Center is now soliciting proposals for its FY 2002 Quick Response (QR) Research Program, which enables social scientists from the U.S. to conduct short-term studies on site immediately after a disaster in order to collect data that would otherwise be lost.

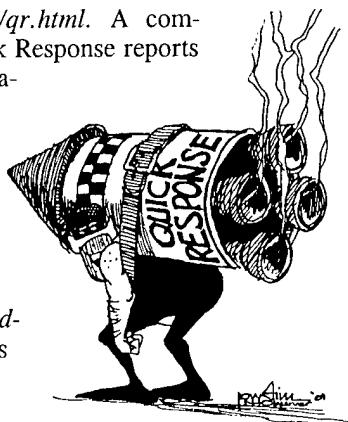
Applicants with approved proposals are eligible to receive funding to carry out their investigation should an appropriate disaster occur in the coming 12 months. Grants average between \$1,000 and \$3,000 and essentially cover only food, lodging, and travel expenses. In return, grantees must submit reports of their findings, which are published by the Natural Hazards Center both on the World Wide Web and in hard copy.

Details about proposal submission can be obtained from the center's Web site: www.colorado.edu/hazards/qr2002.html, or by requesting a 2002 QR Program Announcement from *Mary Fran Myers, Co-Director, Natural Hazards Center, 482 UCB, University of Colorado, Boulder, CO*

80309-0482; (303) 492-2150; fax: (303) 492-2151; e-mail: myersmf@colorado.edu. The deadline for proposal submission is October 15, 2001.

The full texts of Quick Response reports published since November 1995 can be obtained from the Natural Hazards Center's web site: www.colorado.edu/hazards/qr/qr.html. A complete list of all past Quick Response reports and all our other publications, along with their prices, is available at no charge from www.colorado.edu/hazards/publist.html.

This list can also be purchased for \$4.00 from the *Publications Administrator* at the address below.



And Two New Quick Response Reports

The Natural Hazards Center's Quick Response Program discussed above has resulted in over 100 reports on disasters of almost all kinds. The newest studies include:

www.colorado.edu.hazards/qr/qr135/qr135.html

- **Quick Response Report #135: "We Want Work": Rural Women in the Gujarat Drought and Earthquake** (24 pp.), by Elaine Enarson, Institute for Women's Studies and Services, Metropolitan State College.

In March, the Disaster Mitigation Institute (DMI) in Ahmedabad, India, assessed the compound effects of sustained drought and January's massive Bhuj earthquake on the livelihoods of poor women in the district of Surendranagar. DMI approaches disasters as "unresolved problems arising from the very processes of development," and women's livelihoods in disaster-vulnerable regions and their roles in disaster recovery are a particular concern. This report provides the major findings of the DMI study. It addresses, in turn, indicators of gender vulnerability in India and Surendranagar, the guiding research questions, the research method and study site, findings and implications, future research needs, and final observations.

www.colorado.edu.hazards/qr/qr136/qr136.html

- **Quick Response Report #136: South Carolina Drought Mitigation and Response Assessment:**

1998-2000 Drought (31 pp.), by Cody L. Knutson, Water Policy Consultant, and Michael J. Hayes, National Drought Mitigation Center, University of Nebraska-Lincoln.

This study is an assessment of the effects of a once-in-a-hundred-year drought in South Carolina, beginning in June 1998 and continuing into this year. The study was undertaken to provide a "snapshot" of the state's primary drought concerns, impacts, and mitigation and response measures. It includes its own general findings and recommendations, the recommendations of the state's Drought Response Committees (DRCs), and more specific recommendations regarding tourism and recreation, agricultural production, water suppliers, rural water, environmental issues, and forest and timber reserves.

A complete list of Quick Response reports is available on-line from www.colorado.edu/hazards/qr/qr.html. Printed copies can be purchased for \$5.00 each, plus shipping (\$5.00, U.S.; \$8.00, Canada; \$12.00, Mexico; \$18.00, beyond North America). Orders should be directed to the *Publications Administrator, Natural Hazards Center, 482 UCB, University of Colorado, Boulder, CO 80309-0482; (303) 492-6819; fax: (303) 492-2151; e-mail: janet.kroekel@colorado.edu*. Prepayment is required, and checks should be payable to the University of Colorado. Matercard, Visa, American Express, and Diner's Club cards are also accepted.

Introducing the Center for Hazards and Risk Research

By establishing a new Center for Hazards and Risk Research, Columbia University's Earth Institute hopes to revolutionize the ways in which hazards are defined and analyzed and to help communities around the world protect themselves against these perils.

Drawing on the long history of earth science research at Columbia's Lamont-Doherty Earth Observatory, the new center will unite basic earth scientists with sociologists, economists, and representatives of other disciplines to produce integrated and effective assessments of hazards risks. The center will concentrate on natural processes such as earthquakes, floods, landslides, and extreme weather, and on environmental hazards, such as air and water pollution and climate change.

Recognizing that "massive investments in scientific research, regulatory mechanisms, and financial risk management tools have failed up until now to substantially reduce losses," the center intends to expand the range of approaches to hazards mitigation by also addressing such issues as communication and knowledge dissemination, public awareness, economics and wealth distribution, policy formation and political questions, development, land-use planning, and community resilience.

One of the first projects on the Center's agenda will be the design of a "Multi-Hazard Vulnerability Index"—a composite measure of disaster risk. Center researchers believe this index will be a useful tool that will help focus attention on slowly developing hazards, such as the massive earthquake scientists now predict will topple Istanbul within 30 years.

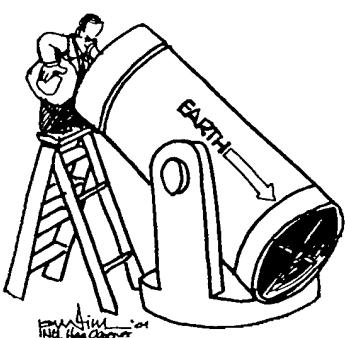
A "virtual center," the Center for Hazards and Risk Research will combine the talents of several Columbia schools, institutes, and centers, such as Columbia's Lamont-Doherty Earth Observatory, School of Engineering, School of International and Public Affairs, Center for Science Policy Outcomes, Center for Decision Sciences, and Center for International Earth Science Information Networks. Whenever possible the center will also collaborate with other academic, government, and international institutions and agencies.

More information about Columbia's new Center for Hazards and Risk Research can be found at www.ldeo.columbia.edu/CHRR/. Interested persons can also contact the *Center for Hazards and Risk Research, Lamont-Doherty Earth Observatory, Columbia University, 230 Seismology, Route 9W, Palisades, NY 10964; (845) 365-8909; fax: (845) 365-8150; Art Lerner-Lam, e-mail: lerner@ldeo.columbia.edu; or Kathleen Boyer, e-mail: kb42@columbia.edu*.



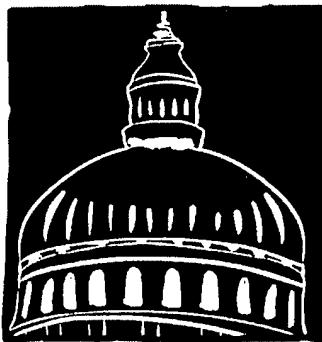
Presenting EarthScope

EarthScope is an integrated, multiorganizational program to apply modern observational, analytical, and telecommunications technologies to investigate the structure and evolution of the North American continent and the physical processes controlling earthquakes and volcanic eruptions. EarthScope will provide a foundation for fundamental and applied research that will contribute to the mitigation of risk from geological hazards, development of natural resources, and understanding of earth dynamics. The program will address such fundamental questions as "Why do earthquakes and volcanic eruptions occur?" "How do continents form and evolve?"



EarthScope will combine several sophisticated geophysical monitoring and measurement systems with data and observations from other disciplines. The project is a partnership involving more than 100 universities, the National Science Foundation, U.S. Geological Survey, National Aeronautics and Space Administration, Department of Energy, regional seismic networks, and state geological surveys.

Detailed information about EarthScope is available on the World Wide Web from www.earthscope.org. In particular, program brochures can be downloaded from www.earthscope.org/EarthScope1.pdf, and www.earthscope.org/EarthScope2.pdf.



WASHINGTON UPDATE

Director Reorganizes FEMA

In the last issue of the *Observer* (Vol. XXV, No. 6, p. 8), we mentioned that President Bush had created a new Office of National Preparedness in the Federal Emergency Management Agency (FEMA). Recently, FEMA Director Joe Allbaugh announced additional realignments within the agency. Director Allbaugh believes the new agency structure will "flatten the organization where possible; reduce the number of organizations reporting directly to the Office of the Director; and consolidate like functions." In addition, Allbaugh changed the title of agency directorate heads from Associate Director or Executive Associate Director to Assistant Director. However, the Administrators of the Federal Insurance Administration and the United States Fire Administration will retain their titles as prescribed by law.

The new offices in FEMA include:

- **Office of National Preparedness** — This office will coordinate all federal programs dealing with weapons of mass destruction consequence management.
- **Strategic Planning and Evaluation** — This office will lead the development, implementation, and management of the agency's strategic plan.
- **External Affairs Directorate** — The agency's congressional, intergovernmental, public affairs, and international outreach functions are combined under this new directorate.
- **Readiness, Response, and Recovery Directorate** — The preparedness, training, exercise, response, recovery, and disaster logistics functions are combined in this group.
- **Federal Insurance and Mitigation Administration** — The directorate combines the agency's mitigation functions with its federal insurance responsibilities.
- **Regional Operations** — This office retains the oversight of FEMA regional offices.
- **Office of General Counsel** — This office will assume an increased role in policy coordination and the "Defense Production Act function."

- **United States Fire Administration** — This office retains its original functions, but will now oversee the administration of FEMA's Fire Grants Program.
- **Administration and Resource Planning Directorate** — This directorate consolidates all of the agency's nontechnical support functions except information technology services, including human resources, financial, and facilities management functions. A Workforce Development Division has also been created to oversee succession planning and career management and development for FEMA employees.

The Information Technology Services Directorate remains basically unchanged, as do the offices of the Inspector General and Equal Rights. The agency reorganization was fully implemented in August.

For further information about the reorganization, contact the *FEMA Office of Public Affairs*, 500 C Street, S.W., Washington, DC 20472; (202) 646-4600; WWW: www.fema.gov/about/femaorg.htm.



Cerro Grande Board Issues Final Report

The federal officials involved in the prescribed fire in Bandelier National Monument that exploded and destroyed 235 buildings in the Los Alamos, New Mexico, area used "questionable judgement" despite following National Park Service policy, according to the Cerro Grande Prescribed Fire Board of Inquiry, which investigated the fire. The board also concluded that National Park Service policy at the time of the fire "had weaknesses that helped contribute to the chain of events that caused the Cerro Grande Fire to escape" the control area. In addition, the board concluded there was insufficient coordination among federal agencies to handle the fire.

The Board of Inquiry Final Report (2001, 52 pp., free), which contains the findings of the independent review panel evaluating the federal role in the Cerro Grande fire, was released in early June. The board was commissioned to investigate the facts and contributing factors to the event, consider legal and policy issues that apply to the incident and determine compliance with those policies, critique the actions of individuals involved in the prescribed fire, and recommend corrective actions. The report contains a chronology of events surrounding the fire, a detailed explanation of findings and recommendations, and a summary of the actions taken by individuals involved in managing the controlled burn.



The board concluded that the techniques used by Park Service employees to evaluate the fire risk were appropriate, although the factors used to calculate the risk (taken from incorrect information posted on a Park Service web site) were incorrect, resulting in an erroneous assessment of the level of fire risk in the area. The board also concluded that the importance of obtaining replacement firefighting crews to deal with the fire in its early stages was not recognized in a timely manner. Confusion over obtaining resources to

fight the fire resulted in serious delays that allowed the fire to worsen, and the decision to expand the area to ignite for the controlled burn allowed the fire to run into an adjoining area containing much fuel. Also, extreme winds that were not anticipated nor predicted spread the fire too quickly for crews to respond.

The board determined that all federal land management agencies need to develop protocols and guidelines for dealing with complex prescribed burns. Their report is available on-line at www.nps.gov/fire/fireinfo/cerrogrande/reports.htm.

GAO Says Federal Agencies Not Organized to Easily Implement National Fire Plan

Recently, Congress asked the General Accounting Office (GAO) to evaluate the implementation of the National Fire Plan, the philosophical and policy foundation for federal interagency fire management activities. In his testimony before the Subcommittee on Forests and Forest Health in the House of Representatives, Barry T. Hill, Director of GAO's Office of Natural Resources and Environment, stated that implementing the policy's guiding principles and recommendations presents unusual, if not unique, challenges to traditional organizational structures. The multiple agencies that must cope with the wildfire threat under this plan (the National Park Service, the Fish and Wildlife Service, the Bureau of Land Management, the Bureau of Indian Affairs and the U.S. Forest Service) need an effective strategy that uses a full range of fire management strategies. Thus, the policy requires federal fire managers to forge new working relationships with other disciplines and agencies, including those responsible for wildlife, fisheries, vegetation, and watershed management.

GAO's preliminary data indicate that:

- Decades of fire suppression by the federal government and others has resulted in dangerous accumulations of hazardous fuels on 211 million acres of federal land.
- Many of the National Fire Plan's guiding principles have not been implemented.
- The failure of the federal agencies to incorporate many of the plan's recommendations can be traced to their reluctance to change their traditional organization structures. As a result, the agencies continue to undertake wildland fire management activities "primarily on an agency-by-agency and unit-by-unit basis."

Hill's testimony is contained in *The National Fire Plan: Federal Agencies are not Effectively Organized to Effectively and Efficiently Implement the Plan* (Report No. GAO-01-1022T, 2001, 15 pp., free). It can be obtained from the U.S. General Accounting Office, P.O. Box 37050, Washington, DC 20013; (202) 512-6000; fax: (202) 512-6061; e-mail: info@www.gao.gov; WWW: www.gao.gov.

Congress Provides Supplemental Appropriations for Disaster Relief

On July 24, 2001, President Bush signed into law a supplemental appropriations bill (Public Law 107-20) that provides funding for the fiscal year ending September 30, 2001, for activities ranging from payment to the Radiation Exposure Compensation Trust Fund to human space flight. Although numerous budget rescissions (reductions in current funding) were also included in the legislation, several disaster relief activities were funded.

Among the appropriations are:

- \$35.5 million to the Natural Resources Conservation Service for watershed and flood prevention operations to repair damage to waterways and watersheds resulting from natural disasters;
- \$9 million to the U.S. Army Corps of Engineers for flood control activities along the Mississippi River and tributaries in Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee, and for emergency expenses due to flooding and other natural disasters. Congress also gave the Corps \$86.5 million for general operation and maintenance, provided that \$8 million of that amount are used "to repair, restore, and clean up Corps' projects and facilities, dredge navigation channels, restore and clean out area streams, provide emergency streambank protection, restore other crucial public infrastructure (including sewer and water facilities), document flood impacts, and undertake other flood recovery efforts . . . due to the July 2001 flooding in Southern and Central West Virginia";

- an additional \$50 million to the Corps for emergency flood control, hurricane, and shore protection activities;
- \$17.7 million to the U.S. Fish and Wildlife Service to repair damage caused by floods, ice storms, and earthquakes in several states;
- \$4 million to the Coast Guard for the repair of facilities damaged during the Nisqually earthquake and for the costs of relocating Coast Guard assets following the quake; and
- \$27.6 million to the Federal Highway Administration for the repair or replacement of highways, including seismically vulnerable roadways recently damaged by the Nisqually quake.

Regarding failed attempts by members of Congress to include additional funding for FEMA for disaster relief, President Bush stated, "I applaud the Congress for passing this bill without resorting to the abusive use of the emergency designation. We have seen 'emergencies' become a recurring part of the budget process, and become magnets for special-interest, non-essential spending. I will continue to work with the Congress and the Federal Emergency Management Agency to see that FEMA meets its obligations to perform its extremely important role of disaster relief in a thorough and timely manner."

The complete text of the legislation, as well as background information and related amendments, can be found at any *federal government repository library* or on the *Library of Congress web site: thomas.loc.gov*.



GAO Says NFIP Not Actuarially Sound

The National Flood Insurance Program (NFIP) is not actuarially sound because it does not collect enough in premium payments to build reserves that will adequately cover long-term future expected flood losses, according to the GAO. However, the program was deliberately designed this way because Congress authorized subsidized insurance rates to be made available for certain structures in an effort to encourage communities to join the program.

In his testimony before the House of Representatives Subcommittee on Housing and Community Opportunity, Stanley J. Czerwinski, Director of the GAO's Physical Infrastructure Issues office, provides information on the financial aspects of operating the NFIP since 1993, the soundness of the program, and the impact of repetitive flood losses on the program. His testimony is available in the GAO report *Flood Insurance: Information on the Financial Condition of the National Flood Insurance Program* (Report No. GAO-01-992T, 2001, 13 pp., free).

Czerwinski notes that, while the magnitude of flood damage varies considerably from year to year, the program has operated without financial loss for the past two fiscal years. During the prior eight fiscal years, however, losses exceeded premiums collected, and during the first six years of that period, the NFIP experienced cumulative losses of

about \$1.56 billion for the program, forcing FEMA to borrow from the U.S. Treasury. Yet, during fiscal years 1999 and 2000, the NFIP gathered enough revenues to repay the loan and establish a reserve of \$720 million.

As of the year 2000, the NFIP subsidized about 30% of its policies. Since no catastrophic losses (over \$5.5 billion in flood damage in one year) have occurred since 1978, collecting premiums based on an average historical loss year does not enable the program to build enough reserves to cover a flood catastrophe.

About 38% of all claims paid by the NFIP cover properties that have experienced repetitive flood damage. These properties, which have had two or more losses greater than \$1,000 within 10 years, receive about \$200 million in claims payments annually. To address this problem, FEMA is

- Identifying repetitive loss properties and creating a special servicing facility to assist these property owners in handling their insurance claims and mitigating their flood hazards;
- Developing a proposal to Congress to reduce the subsidy provided to older repetitive loss properties,

terminating coverage for properties that have experienced the highest losses; and

- Eliminating subsidies for vacation homes, rental properties, and other nonprimary properties that experience repeat flooding.

The agency will use Flood Mitigation Assistance funds and Hazard Mitigation Grant Program funds in conjunction with NFIP funds to acquire repetitive loss properties, relocate residents, and initiate other mitigation actions.

Copies of Czerwinski's testimony are free and can be obtained from the *U.S. General Accounting Office, P.O. Box 37050, Washington, DC 20013; (202) 512-6000; fax: (202) 512-6061; e-mail: info@www.gao.gov; WWW: www.gao.gov*.

Robert F. Shea, Jr., Acting Administrator of FEMA's Federal Insurance and Mitigation Administration, also testified before the subcommittee on the problem of repetitive loss properties. His prepared testimony can be found on-line at www.fema.gov/nwz01/nwz01_68.htm.

Floodplain Managers Urge Policy of "No Adverse Impact"

Annual flood losses in the United States have continued to increase despite 75 years of federal flood control efforts and the 30-year-old National Flood Insurance Program. According to the Association of State Floodplain Managers (ASFPM), this trend is unnecessary and has continued primarily because of federal policies that have encouraged at-risk development, insufficiently considered the impacts of development on other properties as well as future flood and erosion risks, justified flood control projects using a benefit-to-cost ratio policy that encourages increased land use within a floodplain, and engendered an unhealthy reliance on federal funding for flood control projects by state and local governments.

Concerned about this needlessly rising flood damage, the ASFPM has adopted a new program policy objective for the nation: "No Adverse Impact."

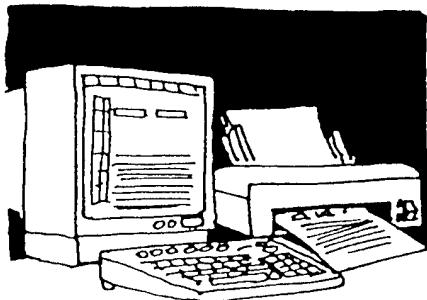
The new policy calls for balancing structural and nonstructural flooding solutions to ensure that no construction in a watershed will adversely impact other property by increasing flood depths or velocities upstream or down. The ASFPM emphasizes that comprehensive local watershed plans should ensure that all

potential adverse impacts are properly planned for and mitigated to avoid such increases. According to the association, this approach "promotes fairness, responsibility, community involvement and planning, sustainable development, and local land use management while not infringing on private property rights. These concepts support the sustainable community initiatives to reduce the devastation caused by natural disasters."

The ASFPM has prepared a flyer, *No Adverse Impact: A Commonsense Strategy for Protecting Your Property* (2001, 4 pp., \$1.00 for a single copy, 50¢ each for bulk copies), that describes this approach and provides examples of its success in communities throughout the U.S. Information regarding the new policy, including the report *No Adverse Impact: A New Direction in Floodplain Management Policy*, by Larry Larson and Doug Plasencia, (2001, 25 pp.), a list of policy recommendations by the ASFPM, and a list of resources and related information can be found on the association's web site: www.floods.org.

To obtain any of these items, contact the *ASFPM, 2809 Fish Hatchery Road, Madison, WI 53713; (608) 274-0123; e-mail: aspm@floods.org*.





INTERNET PAGES

Below are new or updated Internet resources the Hazards Center staff has found useful. For a more complete list of some of the better sites dealing with hazards and disasters, see www.colorado.edu/hazards/sites/sites.html.

All Hazards

www.disastersafety.org

The Institute for Business and Home Safety (IBHS) has launched this new web site to offer home and business owners tips on hazards safety and planning. Currently, the site focuses on hurricane mitigation, although other hazards will be addressed in the future. It includes videos on structural mitigation measures, several print publications in both Spanish and English, as well as links to other resources on the web.

www.flash.org

www.blueprintforsafety.org

FLASH (Florida Alliance for Safe Homes) is a nonprofit organization dedicated to promoting home safety with respect to natural disasters (see the *Observer*, Vol. XXIV, No. 5, p. 9; Vol. XXIII, No. 2, p. 15). The organization's partners include the Institute for Business and Home Safety, the Federal Emergency Management Agency, Florida chapters of the American Red Cross, the Florida Department of Community Affairs, and others. At the second URL above, FLASH has developed a separate web site documenting safe building practices. The site specifically addresses wind hazards, wildfire, and floods, and includes a glossary, a list of resource organizations, and a library of building design diagrams. For more information about FLASH, contact *Traci Buzbee, Outreach Director, FLASH, 1430 Piedmont Drive East, Tallahassee, FL 32312; (850) 385-7233; fax: (850) 386-7371; e-mail: flash@flains.org*.

www.csc.noaa.gov/vata/

The NOAA Coastal Services Center (CSC) Vulnerability Assessment Techniques and Applications (VATA) web site provides risk and vulnerability assessment techniques and resources to assist communities in making sound decisions to protect lives and property, maintain economic stability, and preserve the environment. It also houses information about the Vulnerability Assessment Techniques Workshops currently being hosted by the Organization of American States (OAS) Unit for Sustainable Development and Environment (USDE) and the CSC. That information is intended to supplement or even replace actual attendance at these workshops that were initiated to create networking opportunities for exploring new ideas and potential partnerships in the application of vulnerability assessments.

More information on VATA and the workshops is available from the web site. In addition, the developers plan to institute both a bulletin board and an on-line system for submitting case studies. Because this project is in its infancy, the people at the CSC are interested in feedback about how it could be made more valuable.

www.ofcm.gov

www.ofcm.gov/Risk/Proceedings/RiskProceedings2001.htm

The Office of the Federal Coordinator for Meteorology (OFCM) is a federal interdepartmental office established in 1964 because Congress and the president recognized the importance of full coordination of all federal meteorological activities. Hence, the mission of the office is to ensure the effective use of federal meteorological resources by integrating weather services and supporting research among the 15 participating federal agencies. The OFCM also prepares operations plans, conducts studies, and responds to special inquiries and investigations. Its web site provides more information about the office, numerous publications about federal meteorological plans and programs, and a section on "Special Projects" that includes proceedings from such meetings as the National Hurricane Conference and, at the second URL above, the Forum on Risk Management and Assessments of Natural Hazards held earlier this year.

www.tallytown.com/redcross

The industrious folks at the [Florida] Capital Area Chapter of the American Red Cross (who put out a lot of disaster preparedness, response, and mitigation information on the web) have added several new resources to their site.

First, the site now includes the new *Building Disaster Resistant Neighborhoods Handbook*, available via the Disaster Resistant Neighborhood link. This handbook outlines a step by step action plan, with examples, to assist neighborhood associations to prepare for disasters. Posted along with the handbook are a variety of marketing tools to promote the program. Also posted are the applications for three successfully funded Disaster Resistant Neighborhood initiatives.

With the discovery of West Nile Virus in North Florida during early July, the Capital Area Chapter has also established a West Nile Virus Information web section. This site contains fact sheets, maps, and reporting and surveillance information on the virus; educational information such as *Mosquitoes: How To Control Them*; educational programs for children; and links to related web sites.

www.ncem.org/mitigation

Reflecting the increasing emphasis on hazard mitigation among government agencies involved in disaster management, the North Carolina Division of Emergency Management has created this comprehensive "Hazard Mitigation in North Carolina" web page for citizens of the state. It includes current information on home protection measures, mitigation funding, the National Flood Insurance Program, mitigation planning, legal services, publications, presentations, and upcoming events, as well as a section entitled "What is Your Risk?," contact information, and related web links.

www.hah-emergency.net/

Early in May, the Healthcare Association of Hawaii (HAH) launched this emergency management program web site to aid hospitals and other health care organizations in that state. The site includes information for the general public and restricted content available only to health care emergency managers in Hawaii. It also provides a brief description of the program, which could serve as a model for other health care organizations and associations across the nation. Comments and suggestions are welcome.

www.hsus.org/disaster

www.hsus.org/disaster/disastermonthmain.html

In June, in support of National Disaster Preparedness Month for Animals, the Humane Society of the United States published three downloadable brochures to help animal owners prepare for emergencies:

- *Disaster Preparedness for Pets*
- *Disaster Preparedness for Horses*
- *Disaster Preparedness for Livestock*

These pamphlets are available from the second URL above; at the first is additional information (including on-line brochures in HTML format) on protecting animals from various hazards.

www.drmonline.net

The World Institute for Disaster Risk Management (DRM) is a joint initiative of the Board of the Swiss Federal Institutes of Technology and Virginia Tech University in conjunction with the World Bank's ProVention Consortium. It was created to promote applied research, implementation, and dissemination in the field of disaster risk management (see the *Observer*, Vol. XXIV, No. 5, p. 15).

DRM's objective is to enable people to anticipate disasters and take action to protect life and property while ensuring sustainable social and economic development. The new DRM web site describes the institute, the DRM network and current projects, and also offers several on-line DRM publications. To obtain further information about DRM, contact the *World Institute for Disaster Risk Management, Alexandria Research Institute, 206 North Washington Street, Suite 400, Alexandria, VA 22314; (703) 518-8080; fax: (703) 518-8085; e-mail: widrm@vt.edu; or DRM, c/o ETH Board, Haldelwig 15, ETH Centre, CH-8092 Zurich, Switzerland; tel: +41 1 632 20 02; fax: + 41 1 632 11 90; e-mail: DRM@ethrat.ch.*

www.hazpac.org

www.crowdingtherim.org

HAZPAC, short for "Hazards of the Pacific," is a GIS database that allows users to search and use a comprehensive record of historic disasters for the entire Pacific region. The database contains information regarding earthquakes, tsunamis, volcanic eruptions, and tropical storms, as well details about human infrastructure systems such as cities, roads, utilities, railroads, and major air routes. Users can specify the type and location of disaster information to be displayed, permitting both detailed (city-specific) and broad-scale investigations of the disaster record. Because HAZPAC is a GIS database, specific information about each data set is available, allowing users to identify, for instance, the population of a particular city or the date and magnitude of an earthquake. HAZPAC was developed as part of the "Crowding the Rim" initiative, a partnership among the U.S. Geological Survey, Circum-Pacific Council, American Red Cross, and Stanford University—hosts of an international workshop held in August in California (for details, see the second URL above).

www.eird.org

The United Nation's International Strategy for Disaster Reduction (ISDR) Unit for Latin America and the Caribbean has launched this new web site to promote disaster mitigation in the region and to help the unit better respond to the many

information requests it receives daily. The site provides information about the goals and many initiatives of the ISDR and related events. It also provides on-line documents, such as the *ISDR Informs* magazine and the monthly ISDR *Highlights*, and an educational section for children. The site is in both Spanish and English, and the developers welcome comments and contributions.

www.who.int/eha/disasters/newsletter.shtml

This site hosts the *Health in Emergencies* newsletter published by the Department of Emergency and Humanitarian Action of the World Health Organization. The June issue focuses on challenges to reproductive health in emergencies and includes technical information as well as stories about specific locations and experiences.

www.bghrc.com

We recently received an e-mail announcing that the second issue of the Benfield Greig Hazard Research Centre's newsletter, *Alert*, was now available from the centre's web site above. Of course, we promptly took a look to see what our colleagues across the pond are up to, and, well, they're up to a lot.

Rather than repeat the newsletter here, we'll suggest that interested hazard researchers and planners take a look. The centre's new projects include "Project Claudius," an effort to assess natural hazard risks in Italy and to examine a number of possible financial solutions to mitigate those risks; "Project RUNOUT," an attempt to develop early warning forecast techniques for large landslides, particularly along artificial reservoirs; TropicalStormRisk (TSR), a method for determining seasonal tropical cyclone forecasts; and a project examining "Social Responsibility in Disaster Reduction Projects," that focuses on private-sector involvement in five South Asia countries. The centre also announced formation of a "Seismic Risk Group" (SRG) to examine all aspects of seismic risk—from palaeoseismology to post-earthquake recovery.

www.worldbank.org/dmf/

www.worldbank.org/html/fpd/dmf/conceptual_articles.htm

The Worldbank's Disaster Management Facility (DMF) web site includes a series of succinct "Conceptual Articles" at the second URL above:

- *Megacities, Megarisk* describes how proper planning by local governments can reduce the human and financial loss incurred by large cities.
- *Using Microfinance for Disaster Mitigation* discusses how small, individual finance programs have helped the poor in developing countries maintain income and consumption levels in the face of accidents, death, or illness.
- *Myths and Realities* explains how the impact of disasters on populations can be much less severe when certain widely held beliefs and broadly circulated myths are abandoned.
- *Innovations in Disaster Management: Mobilizing Private Financing* discusses the increasing importance of private finance as the capacity of international lenders to provide assistance falls short.
- *What Emerged from the Rubble* examines how enforcement of building code laws could have minimized the devastation and massive loss of life caused by the earthquakes that hit Turkey last year.
- *Hedging Your Bets* describes research into new insurance mechanisms to help the rural poor deal with disasters.



Wildfire

www.fireplan.gov

In August 2000, the president directed the Secretaries of Agriculture and the Interior to develop a response to severe wildland fires, reduce fire impacts on rural communities, and ensure sufficient firefighting capacity in the future. Congress in turn mandated implementation of a National Fire Plan (NFP) through its legislation and appropriations. The resultant NFP (see the *Observer*, Vol. XXV, No. 3, p. 11) addresses conditions that have evolved over many decades and cannot be reversed in a single year. Thus, it is a long-term commitment based on cooperation and communication among federal agencies, states, local governments, tribes, and other interested parties.

The new National Fire Plan (NFP) web site hosted by the National Forest Service, Department of Interior, and National Association of State Foresters, documents how the federal government and state partners manage wildfire and wildfire impacts and focuses on preparedness and mitigation activities that can significantly reduce property and natural resource loss, as well as improve public safety. The site lists NFP activities in each state, provides current fire information, offers several background reports and publications, and provides individual sections covering the key points of the NFP: firefighting, rehabilitation/restoration, hazardous fuel reduction, community assistance, and accountability.

Hurricanes

www.usgs.gov/hurricanes/stormsites.html

The U.S. Geological Survey (USGS) has consolidated its Internet-based information and resources on hurricanes by creating this "USGS Hurricanes and Coastal Storm Websites" page with links to other USGS sites that provide real-time data, background maps and studies, historical analyses of specific storms, and other reports on hurricanes.

Floods

www.uthouston.edu/gateway/emergency.htm

research.uth.tmc.edu/Floodnews.htm

To see the consequences for an institution of higher education due to a tropical storm (or any natural hazard, for that matter), check these web pages and learn how Tropical Storm Allison affected the University of Texas Health Science Center at Houston.

water.usgs.gov/nwis/

The U.S. Geological Survey (USGS) has just launched this new, on-line National Water Information System, dubbed "NWISWeb," which provides 100 years of water data collected by this federal earth science agency. The new site integrates real-time and historical streamflow data with many other types of water information, including historical water-quality data from rivers and aquifers; historical ground-water-level data; and real-time water quality, precipitation, and ground-water levels. This consolidated information can help users

- Evaluate current water supplies and plan for future supplies;
- Forecast floods and droughts;
- Operate reservoirs for hydropower, flood control, or water supply;
- Evaluate and control water quality;
- Navigate rivers and streams; and,
- Safely fish, canoe, kayak, or raft.

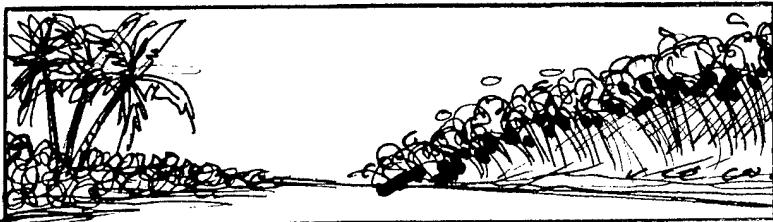
NWISWeb is easy to use and allows clients not only to access data from the entire nation, but also to specify, search, and display data as desired (as graphs vs. tables, for example). Users who expect to make large and/or frequent requests are urged to first e-mail smtrapan@usgs.gov.

Tsunamis

www.tsunamicommunity.org

Created by an ad hoc committee of 14 tsunami researchers, this web site is intended to be a stage for presentation of research in progress and a forum for data exchange. As listed on its introductory page, the site's goals are:

- To describe tsunami generation,
- To facilitate tsunami hazard mitigation,
- To document historical tsunamis,
- To provide tsunami benchmark problems,
- To distribute seafloor bathymetry,
- To showcase community models,
- To provide tsunami case studies,
- To simulate future tsunami scenarios, and
- To gather tsunami links and tsongs [sic].



tgsv5.nws.noaa.gov/pr/hq/itic.htm

www.shoa.cl/oceano/itic/frontpage.html

These two web pages provide information from and about the International Tsunami Information Center (ITIC) and the International Coordinating Group for the Tsunami Warning System in the Pacific (ICG/ITSU). The first includes a "Tsunami Reading List" and a history of the organizations. The second provides updated information on recent tsunamis and earthquakes, details about upcoming conferences, the ITIC newsletter, field reports, conference proceedings, full-text documents (including post-tsunami survey handbooks in various languages and the warning system's communication plan), and recent tsunami watches or warnings. Further information on ITIC and the Tsunami Warning System in the Pacific are available from the *International Tsunami Information Center Grosvenor Center, Mauka Tower, 737 Bishop Street, Suite 2200, Honolulu, HI 96813; (808) 532-6422; fax: (808) 532-5576; e-mail: itic@moana.itic.noaa.gov*.

www.geocities.com/capecanaveral/lab/1029

Longtime tsunami researcher George Pararas-Carayannis has assembled this colorful site, which includes bulletins about recent events, conference announcements and reviews, tsunami FAQs (frequently asked questions), a section on societal

effects of tsunamis, a section on physical properties, a database of historical tsunamis, bibliographies, descriptions of tsunami warning systems, a section on prediction and evaluation, a glossary, and links to other tsunami information on the web.

www1.tpgi.com.au/users/tps-seti/spacegd7.html

This site, prepared by Australian Michael Paine, offers a treatise on potential tsunamis generated by asteroid or comet impacts. Besides attractive graphics and animation, the site is well-documented and includes links to numerous other scholarly works on this hazard.

Earthquakes

www.pmel.noaa.gov/vents/acoustics/seismicity/nepac/gordaridge01.html

Want to *hear* an earthquake? From this web site, you can listen to seismic rumblings that followed an April 3 volcanic eruption off the coast of Oregon—brought to you by NOAA's Pacific Marine Environmental Laboratory. (This is but a small corner of the excellent PMEL web site, which hosts much information about earthquakes, volcanoes, tsunamis, and other hazards of the Pacific Rim.)

www.booth-seismic.co.uk/Gujarat

Sponsored by the Indian National Trust for Arts and Cultural Heritage, Edmund Booth, a British seismic engineer, and Rabindra Vasavada, an architect from Ahmedabad, India, toured the earthquake-affected region of Gujarat, India, in March of this year to determine the effects of January's massive quake on the palaces and other heritage buildings in the area. Their findings are available from this web site.

Introducing EERI's *Encyclopedia of Housing Construction Types in Seismically Prone Areas of the World*

The Earthquake Engineering Research Institute (EERI) has undertaken a joint project with the International Association of Earthquake Engineering (IAEE) to create an interactive, web-based encyclopedia of housing construction types in seismically prone areas of the world.

The project will enable instant information exchange among engineers, architects, and other professionals throughout the world, providing tools to improve housing vulnerable to earthquakes and thereby reducing future economic losses and saving lives. Examples received so far from various countries that will form the basis for the web site can be viewed at www.johnmartin.com/EERI.

The developers of this project hope that the web site will build a community of knowledgeable workers in this area. Indeed, a next step is to organize this group, through activities such as training courses and demonstration projects, so that the knowledge can be shared with those actively engaged in planning, designing, constructing, and renovating housing. The web site will be completed and ready for use in December 2002.

The project steering committee has developed a standardized, multi-question form that participants can use to describe various construction types in their respective countries. The resulting database will be searchable by various parameters—country,

seismic hazards, building function, building type, and other dimensions—and users will be able to generate graphs, tables, and presentations; view photos and drawings; and print summary forms. They will also be able to compare strengths and vulnerabilities of various construction systems and strengthening technologies, determine generally the number of people living in a specific type of structure, and evaluate each country's vulnerability to a particular building type. The site will include basic information on earthquakes and building performance in quakes, an array of global housing statistics, and country-specific information covering a host of physical and demographic data. Users will also be able to generate the encyclopedia in whole or in part as a conventional hard copy publication.

EERI and IAEE are seeking participants willing to contribute information on the housing in their own countries. A background in architecture or structural engineering is helpful. To date, over 160 volunteer engineers and architects from 45 different countries have agreed to participate. A complete roster can be downloaded from the EERI web site: www.eeri.org. Interested persons should send an e-mail to *Svetlana Brzev, Project Chair, sbrzev@bcit.ca*, or *Marjorie Greene, EERI Special Projects Manager, mgreene@eeri.org*.



CONTRACTS AND GRANTS

Below are descriptions of recently awarded contracts and grants for the study of hazards and disasters. An inventory of contracts and grants awarded from 1995 to the present (primarily those funded by the National Science Foundation) is available on the Natural Hazards Center's web site: www.colorado.edu/hazards/grants.html.

Measuring the Environmental Context of Social Vulnerability to Urban Earthquake Hazards: An Integrative Remote Sensing and GIS Approach. Funding: National Science Foundation, \$6,125, 24 months. Principal Investigator: *John R. Weeks, Department of Geography, Mail Code 4493, San Diego State University, San Diego, CA; (619) 594-8040; e-mail: jrweeks@mail.sdsu.edu.*

This funding will support doctoral dissertation research that analyzes the human ecology of urban earthquake risks using remote sensing, geographic information systems (GIS), and spatial analysis. The researcher will examine the use of the built and natural environments to understand social processes associated with the 1994 Northridge earthquake in the Los Angeles metropolitan area. He will identify urban land-cover attributes that are strongly associated with high and low levels of social vulnerability to earthquake hazards and evaluate whether social vulnerability is reflected in spatial elements of urban neighborhoods, particularly geographic conditions, the form and development of settlements, and the structure of open spaces. Due to the relatively low cost of these techniques, they can be suitably modified for use by local governments in both developed and developing countries.

Technological Disaster, Resource Loss and Long-Term Social Change in a Subarctic Community. Funding: National Science Foundation, \$210,416, 24 months. Principal Investigator: *J. Steven Picou, Department of Sociology and Anthropology, University of South Alabama, Mobile, AL; e-mail: spicou@jaguar1.usouthal.edu.*

Picou will identify patterns of social change in a small fishing community affected by the Exxon Valdez oil spill in 1989. Based on survey and ethnographic data collected from 1989 through 2001, the loss of ecological, social, and cultural resources will be evaluated and related to patterns of community stress and change.

Quick Response Study: The Gujarat, India, Earthquake of 26 January 2001. Funding: National Science Foundation, \$10,613, six months. Principal Investigator: *Louise K. Comfort, Graduate School of Public and International Affairs, University of Pittsburgh, Pittsburgh, PA; e-mail: lkc@pitt.edu.*

Comfort was part of an interdisciplinary, international reconnaissance team, organized by seismic safety institutions, to study the impacts of the Gujarat earthquake in India. She interviewed public, private, and nonprofit organizations to identify the types of information technologies used during the disaster response, how well the technologies met their needs, and areas where improvement is needed. Combining this data with geographic information, she will generate a map of information flows among organizations.

Improved Liquefaction Hazard Mapping Procedures for Urban Areas. Funding: National Science Foundation, \$54,727, 12 months. Principal Investigator: *T. Leslie Youd, Department of Civil and Environmental Engineering, Brigham Young University, Provo, UT; e-mail: tyoud@byu.edu.*

Liquefaction—soil behaving like liquid during earthquake shaking—has caused widespread damage to urban areas of both the U.S. and Japan. This destruction has created public demand for state and local governments, public utilities, and other agencies and businesses to mitigate liquefaction hazards in their respective jurisdictions. An initial stage of hazard mitigation is the identification of vulnerable areas and their potential effects, and city planners, building officials, engineers, utility companies, and loss estimators need maps with more detail and accuracy than are currently available. The purpose of this study is to develop improved mapping techniques for delineation of liquefaction hazards.

Collaborative Research on Volcanic Hazard Mitigation in Guatemala and El Salvador. Funding: National Science Foundation, \$60,000, 36 months. Principal Investigators: *William I. Rose and James W. Vallance, Michigan Technological University, Houghton, MI; e-mail: raman@mtu.edu.*

This award will support a collaborative effort between the investigators and the seismological institutes in Guatemala and El Salvador to study volcanic hazard mitigation in those countries, located in one of the most consistently active volcano zones on earth. Many of the volcanoes in this region are close to population centers. The researchers will use satellite remote sensing, survey data, and other technologies to develop a model of current and prospective hazards.

NRC Announces COBASE Grants for Collaborative Research with Central/Eastern Europe and the Newly Independent States

With funding from the National Science Foundation (NSF), the Office for Central Europe and Eurasia of the National Research Council (NRC—the operating arm of the National Academies) offers grants to individual American specialists who plan to establish new research partnerships with colleagues from Central/Eastern Europe (CEE) and the Newly Independent States (NIS). Although proposals are accepted for collaborative research in all fields of basic science supported by NSF, this year the Collaboration in Basic Science and Engineering (COBASE) program has added three focus areas in which applications will be given special priority, one of which is *extreme events*.

Project Development and Initiation Grants support American researchers who wish to host and/or visit their CEE or NIS colleagues in order to initiate research projects and prepare collaborative research proposals for submission to NSF. U.S. applicants may request support for up to two visits in either or both directions. Grants will be in the range of \$2,500 to \$10,000.

Participating countries include Armenia, Azerbaijan (traveling only), Bosnia (hosting in U.S. only), Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, (former Yugoslav Republic of) Macedonia, Moldova, Poland, Romania, Russia (see the project web site for an updated list of ineligible partner institutions), Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

Only fields funded by NSF are eligible, including archaeology and anthropology; astronomy; biochemistry, biophysics and genetics; biological sciences; chemistry; computer science; earth sciences; economics; engineering; environmental sciences; geography; history and philosophy of science; linguistics; mathematics; physics; political science; nonclinically oriented psychology; science and technology policy; and sociology. Proposals outside the scope of the program will not be considered.

Although applications are accepted in all fields listed above, three special focus areas have been selected for the coming year: extreme events, Black Sea transboundary issues, and mathematics.

Proposals submitted regarding extreme events could include multidisciplinary research into forecasting, modeling, mitigating, and evaluating the consequences of extreme events. Projects could also focus on techniques for studying processes leading to extreme events or for dealing with



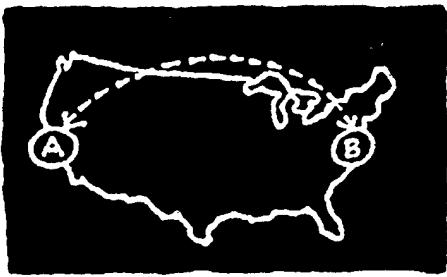
uncertainties regarding predictions and actions taken. As the topic is multidisciplinary in nature, projects involving partners from different scientific fields are required.

Upcoming deadlines include January 4, 2002, and April 15, 2002. Details, application forms, and instructions are available from www.nationalacademies.org/oia. More information is available from the NRC, *Office of International Affairs*, 2101 Constitution Avenue, N.W., Washington, DC 20418; (202) 334-2644; fax: (202) 334-2614; e-mail: ocee@nas.edu.

Request for Proposals Collaborative Research on Disasters in the Americas

The Center for Disaster Management and Humanitarian Assistance (CDMHA) has announced a request for proposals on "Collaborative Research on Disasters in the Americas" (see the previous *Natural Hazards Observer*, Vol. XXV, No. 6, pp. 12-14 for more information about this program and a list of grants awarded this year). Approximately \$600,000 is available to fund up to six one-year projects with budgets up to \$150,000 each, including indirect costs. Proposals will be considered in three areas: 1) public health issues in disasters; 2) social science, disasters, and development; and 3) information technology and decision science

applied to disaster management. Projects must have a Latin America or Caribbean focus and must involve institutional collaboration between North and South American researchers. Letters of intent are due November 1, 2001. Interested researchers should request a copy of the complete request for proposals by contacting *Erin Hughey*, CDMHA; (813) 974-2907; e-mail: ehughey@hsc.usf.edu; or going to the CDMHA web site: www.cdmha.org. Other questions about the research program may be directed to *Jeannine Coreil*; (813) 974-6698; e-mail: jcoreil@hsc.usf.edu; or *Nick Colmenares*; (813) 876-1113; e-mail: erminow@aol.com.



CONFERENCES AND TRAINING

Below are the most recent conference announcements received by the Natural Hazards Center. A comprehensive list of hazard/disaster meetings is posted on our World Wide Web site: <http://www.colorado.edu/hazards/conf.html>.

Sixth International Symposium and Fifth General Assembly of the Organization of World Heritage Cities. Puebla, Mexico: October 3-7, 2001. The theme of this conference is "Risk Preparedness and Emergency Response in the Context of the Management of the World Heritage Cities." Specific topics include philosophy and principles, experiences in administration, intervention and protection, fund-raising and allocation of resources, and specific cases related to natural disasters. For details, contact the *Organizing Committee, Av. 2 Poniente 107, altos Centro Historico C.P. 72000, Puebla, Pue. Mexico; tel: 52-22-32-9183; fax: 52-22-32-9183; e-mail: orggral@ocpmcoloquiopuebla.com.mx; WWW: www.ocpmcoloquiopuebla.com.mx.*

California's 2001 Wildfire Conference and Public Events: "Ten Years after the 1991 East Bay Hills Fire." Sponsors: *The Hills Emergency Forum, University of California Forest Products Laboratory, University of California Extension, and many others. Oakland, California: October 10-12, 2001.* This meeting will focus on sharing the latest research on minimizing losses due to fire in the urban-wildland interface. It is intended to educate and motivate the public to adopt safe behavior with respect to wildfire and to promote interagency cooperation and long-term planning. The conference will bring together government officials, the fire ecology and fire prevention communities, academicians, the media, insurance representatives, developers, and others to determine and implement ways to break the cycle of repetitive wildfire losses. Questions about the program should be addressed to Carol Rice, (925) 944-5282, e-mail: carollrice@aol.com; or Ken Blonski, (510) 215-4277, e-mail: ken.blonski@ucop.edu. Logistical information is available from JoAn Wenker, (530) 757-8604, e-mail: jwenker@unexmail.ucdavis.edu. Interested persons should also see www.universityextension.ucdavis.edu/fire/. To register, call (530) 757-8876 or see www.universityextension.ucdavis.edu.

First Annual Conference on Infrastructure Priorities: A National Infrastructure Research Agenda. Host: Institute for Civil Infrastructure Systems (ICIS), New York University. Washington, D.C. area: October 24-26, 2001. This major conference, funded by the National Science Foundation, will bring together leading researchers, research funders, users, and managers to develop a National Infrastructure Research Agenda (NIRA) to guide future research to improve our nation's civil infrastructure systems. The NIRA will go beyond technical issues and questions and will address cross-cutting institutional, social, and decision-making aspects of infrastructure planning, design, development, and management. The conference is aimed at infrastructure professionals from all sectors. Conference sessions will be organized around five themes: valuing and financing infrastructure, transformation of infrastructure through advanced technologies, institutional change, community engagement, and decision support. Cross-cutting themes such as education, performance measurement, and hazards will be addressed as well. For more information, see the conference web site: www.nyu.edu/icis/InfraPriorities/; or contact the *Institute for Civil Infrastructure Systems, 411 Lafayette Street, Room 300, New York, NY 10003; (212) 992-4247; fax: (212) 995-4875; e-mail: icis.info@nyu.edu.*

Nonstructural Seismic Hazards Training Workshop. Host: U.S. Department of the Interior Seismic Safety Program. Portland, Oregon: November 27-28, 2001. The March 2001 Nisqually earthquake near Seattle provided clear evidence of the significant overall costs associated with nonstructural failures caused by even a moderate earthquake. This workshop will review these potential risks and emphasize the economic justification for taking low-cost steps to mitigate them. It will provide both hands-on training and demonstrations of cost-effective methods to identify and remedy nonstructural problems. The workshop is intended for facilities, operations, and maintenance personnel, as well as designers, engineers, and planners. For details, contact Tyna Petersen, *Workshop Registrar, (303) 445-2573; e-mail: tpetersen@do.usbr.gov*.

Urban Hazards Forum. Sponsors: Federal Emergency Management Agency Region II and John Jay College of Criminal Justice, New York City, New York: January 22-24, 2002. This meeting will focus on the issues involved in the management of urban hazards, including natural and technological events as well as terrorism. It will address such topics as mitigation in densely built areas; public disaster education in multicultural settings; corporate outreach and education; coordination of local, state, and federal resources; weapons of mass destruction in urban areas; and other issues confronting cities. A call for papers has been issued; abstracts are due September 14, 2001. For specifics, contact the *Urban Hazards Forum, Public Management Department, 445 West 59th Street, New York, NY 10019; (212) 237-8049; e-mail: urbanhazardforum@jjay.cuny.edu; WWW: www.jjay.cuny.edu/urbanhazardsforum*.

98th Annual Meeting of the Association of American Geographers (AAG). Los Angeles, California: March 19-23, 2002. The AAG annual meeting includes several sessions on hazards and disasters. For a conference agenda, see www.aag.org, or contact the *AAG, 1710 Sixteenth Street N.W., Washington, DC 20009-3198; (202) 234-1450; fax: (202) 234-2744; e-mail: meeting@aag.org; WWW: www.aag.org*.

Hemispheric Conference on Vulnerability Reduction for Populations and Settlements, Natural Resources, and Urban Lifelines and Infrastructure in Trade Corridor Development. Hosts: University of South Florida, Center for Disaster Management and Humanitarian Assistance (CDMHA); University of South Florida, Globalization Research Center; and Organization of American States (OAS), Unit for Sustainable Development and Environment (USDE). Tampa, Florida: April 18-20, 2002. The focus of this meeting is sustainable development through hazard vulnerability reduction in trade corridors involving member states of the OAS. Such trade corridors exist within the major trade agreement areas (such as NAFTA) affecting the Western Hemisphere. This conference will bring together policy makers, private business representatives, and academicians to formulate an agenda for public policy, research, training, and technology transfer dealing with the reduction of vulnerability to natural and technological hazards of populations in these trade corridors. Participants will examine the historical impact of hazards in such areas, disaster recovery, and mitigation. More information is available from *CDMHA, University of South Florida, College of Public Health — MDC-56, 13201 Bruce B. Downs Boulevard, Tampa, FL 33612; (813) 974-2907; fax: (813) 974-9980; e-mail: cdmha@hsc.usf.edu; WWW: www.cdmha.org; or Stephen Bender, OAS USDE, 1889 F Street, N.W., Washington, DC 20006; (202) 458-6295; fax: (202) 458-3560; e-mail: sbender@oas.org*.

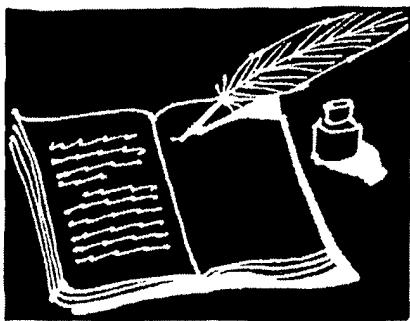
2002 National Disaster Medical System (NDMS) Annual Conference. Sponsors: U.S. Department of Health and Human Services, Department of Defense, Department of Veterans Affairs, and Federal Emergency Management Agency. Atlanta, Georgia: April 13-17, 2002. The 2002 NDMS conference is designed to promote interaction among local, state, and federal public health practitioners and

policy makers. Faculty from a variety of agencies, academic institutions, and voluntary organizations will present over 75 accredited educational sessions on key topics such as weapons of mass destruction, clinical medicine, mental health, response teams, and international coordination. For more information, contact *NDMS, 12300 Twinbrook Parkway, Suite 360, Rockville, MD 20857; (800) 872-6367 or (301) 443-1167; fax: (800) 872-5945 or (301) 443-5146; e-mail: ndms@usa.net; WWW: www.oep-ndms.dhhs.gov*.

Third National Seismic Conference and Workshop on Bridges and Highways. Sponsors: Federal Highway Administration and others. Portland, Oregon: April 28-May 1, 2002. This conference will focus on advances in engineering and technology that provide increased seismic safety in highway bridges, other highway structures, and highway systems—both through original design and retrofit. It will include an international forum and a technology showcase enabling participants to see a wide range of solutions to seismic design of transportation infrastructure. For details on the World Wide Web see mceer.buffalo.edu/meetings/3nsc/default.asp; or contact the *Third National Seismic Conference and Workshop on Bridges and Highways, c/o Multidisciplinary Center for Earthquake Engineering Research, State University of New York at Buffalo, Red Jacket Quadrangle, Buffalo, NY 14261-0052; (716) 645-3391; fax: (716) 645-3399; e-mail: mceer@ascu.buffalo.edu; or Michael Higgins, Regional Manager Eastern Region, Pure Technologies, US Inc., 10015 Old Columbia Road, Suite B-215, Columbia, MD 21046; (410) 309-7050; fax: (410) 309-7051; e-mail: mike.higgins@sounprint.com*.

Third International Conference on Landslides, Slope Stability, and the Safety of Infrastructure. Singapore: July 10-12, 2002. (Preceded by a one-day workshop on "Landslide Causes and Landslide Remediation.") The aim of this conference is to allow engineers and scientists to come together to share new ideas on slope instability and remediation. The conference organizers have identified 14 themes for presentations and technical papers, ranging from landslide investigation to climatic and geological factors influencing landslides, monitoring, hazard analysis, effects on structures, remediation, disaster management, and other topics. Abstracts are due December 15, 2001. Additional information is available from *CI-Premier Ltd, 150 Orchard Road #07-14, Orchard Plaza, Singapore 238841; tel: 065-7332922; fax: 065-2353530; e-mail: cipremie@singnet.com.sg; WWW: www.cipremier.com*.

Holocene Environmental Catastrophes and Recovery. Sponsors: Department of Geography, Brunel University, and others. London, U.K.: September 2-7, 2002. The four main themes of this meeting are geological catastrophes and their impact on society, environmental causes of civilization collapse, biological impacts on societies, and climatological impacts on society. For more information, see www.brunel.ac.uk/depts/geo/Catastrophes/; or contact *Suzanne Leroy, Department of Geography and Earth Sciences, Brunel University, Uxbridge, Middlesex UB8 3PH, U.K.; direct tel: +44-1895-20 31 78; fax: +44-1895-20 32 17; secretary: +44-1895-20 32 15; e-mail: suzanne.leroy@brunel.ac.uk*.



RECENT PUBLICATIONS

Below are summaries of some of the recent, more useful publications on hazards and disasters received by the Natural Hazards Center. Due to space limitations, we have provided descriptions of only a few key publications or those with a title that may not indicate content. All items contain information on how to obtain a copy. A complete bibliography of publications received from 1995 through 2001 is posted on our web site: www.colorado.edu/hazards/bib/bib.html.

Multiple Hazards

The Bulldozer in the Countryside: Suburban Sprawl and the Rise of American Environmentalism. Adam Rome. 2001. 314 pp. \$19.95, paperback; \$54.95, hardbound. Copies can be purchased from the Customer Service Department, Cambridge University Press, 110 Midland Avenue, Port Chester, NY 10573; (800) 872-7423; fax: (914) 937-4712; e-mail: orders@cup.org; WWW: www.cup.org.

The Bulldozer in the Countryside is the first scholarly work to analyze the successes and failures of efforts to address the environmental consequences of suburban growth from the end of World War II to 1970. When the construction of tract housing on millions of acres of land took place in a relatively short period of time, concern grew over the environmental costs of suburban development. The author notes that there is considerable research that examines either the mass migration to the suburbs or the rise of the environmental movement; however, the important connections between the two have not been made. Rome's first chapter considers the political, social, and economic forces behind the rise of tract housing. In subsequent chapters, he presents a history of different environmental issues surrounding homebuilding, including postwar debates over heating and cooling, the problem of waste disposal at the metropolitan fringe, the altered landscape, and effects on water, soil, and wildlife. Of particular note is his chapter entitled "Where Not To Build: The Campaigns to Protect Wetlands, Hillsides, and Floodplains," which contains a brief history of the National Flood Insurance Program as well as a discussion of the role of Gilbert White, founder of the Natural Hazards Research and Applications Information Center, in raising awareness about the impacts of floods on humans and in promoting public policies to reduce those impacts.

Handbook of Crisis and Emergency Management. Public Administration and Public Policy Series 93. 2001. 800 pp. \$195.00. To purchase a copy, contact Marcel Dekker, Inc. Cimarron Road, P.O. Box 5005, Monticello, NY 12701-5185; (800) 228-1160; fax: (845) 796-1772; e-mail: bookorders@dekker.com; WWW: www.dekker.com.

This handbook is intended to instruct politicians, policy makers, administrators, researchers, and others on the wide range of international issues and topics in emergency management within the disciplines of political science, public administration, and public policy. It reviews approaches to natural disasters around the world; considers resolutions to cultural, religious, and political tensions in the Middle East; discusses terrorism and safeguards against the use of biological, chemical, or nuclear weapons; describes the function of crisis public

relations; and addresses other topics. Various contributing authors consider crisis management between and among groups; political, economic, and social crisis management; environmental and health emergency management; conceptual, practical, and empirical aspects of emergency management; and crisis and emergency management in the Americas, Europe, Asia, Africa, and the Near and Middle East.

Natural Hazards of Canada: A Historical Mapping of Significant Natural Disasters. 2001. 24" x 32". Free. Copies of this map can be obtained from the Office of Critical Infrastructure Protection and Emergency Preparedness, 122 Bank Street, 2nd Floor, Ottawa, Ontario, Canada K1A 0W6; (800) 830-3118; fax: (613) 998-9589; WWW: <http://www.ocipep-bpiepc.gc.ca>.

This two-sided poster, prepared through Safe Guard, the Canadian public information program to increase awareness of emergency preparedness in Canada, geographically depicts the natural hazards that afflict that nation. It presents information on earthquakes, floods, tornadoes, hail, landslide and avalanches, icebergs, sea ice and fog, and volcanic eruptions, along with maps that locate these risks and indicate their severity. The hazards are also depicted together in a larger map of the country, along with lists of historical events.

'The Association Between Extreme Precipitation and Waterborne Disease Outbreaks in the United States, 1948-1994.' Frank C. Curriero, Jonathan A. Patz, Joan B. Rose, and Subhash Lele. *American Journal of Public Health*, August 2001, Vol. 91, No. 8, pp. 1194-1199. Annual subscriptions: \$165.00, individual; \$200.00, institution. Single copies: \$17.00. To order, contact the American Public Health Association, Subscriptions, Department 5037, Washington, DC 20061-5037; (202) 777-2462, fax: (202) 777-2532; WWW: www.apha.org/journal/subscribejourn.htm.

According to the U.S. National Assessment on the Potential Consequences of Climate Variability and Change, determining the role of weather in the incidence of waterborne disease outbreaks is a priority public health research issue for this country. Rainfall and runoff have been implicated in several outbreaks in the United Kingdom and the United States. Because upward trends in heavy precipitation in the United States are projected to accompany climate change, this study seeks to quantify the relationship between precipitation and disease outbreaks. The authors find that 51% of waterborne disease outbreaks were preceded by precipitation events above the 90th percentile and 68% by events above the 80th percentile.

World Disasters Report 2001. International Federation of Red Cross and Red Crescent Societies (IFRC). 2001. 250 pp. \$25.00. Shipping and handling within the U.S.: \$4.50 for the first book and \$1.50 for each additional book; outside the U.S.: \$8.00 for the first book and \$2.50 for each additional book. Available from Kumarian Press, Inc., 1294 Blue Hills Avenue, Bloomfield, CT 06002; (860) 243-2098; fax: (860) 243-2867; e-mail: kpbooks@aol.com; WWW: www.kpbooks.com. Information about alternate distributors in Europe and how to order via the web, e-mail, fax, or regular mail is available from www.ifrc.org/publicat/wdr2001.

The 2001 edition of IFRC's *World Disasters Report* focuses on disaster recovery and is particularly critical of international aid that focuses on rebuilding physical structures and infrastructure while overlooking reconstitution of the economy, livelihoods, and social structure of an affected area. The report notes that international disaster aid often fails to contribute to the resilience and durability of communities, leaving locations no better equipped to survive future disasters. Not surprisingly, it calls for an increased emphasis on mitigation and the integration of relief and development. However, it notes that too often funds provided for such projects end up flowing out of the affected country to consultants and other nongovernmental organizations.

On another front, *World Disasters Report 2001* also notes that weather-related disasters appear to be on the rise due to global warming. That change, combined with the ever-increasing population threatened by such hazards, ensures that damage and deaths due to disasters will continue to rise. Chapter summaries and additional information are available on the World Wide Web: www.ifrc.org/publicat/wdr2001.

The Use of Earth Observing Satellites for Hazard Support. A Report of the Committee on Earth Observation Satellites (CEOS) Disaster Management Support Group. 2000. 156 pp. Free. The report is available on-line at: disaster.ceos.org/2000Ceos/progress/index.html

Fair Weather? Equity Concerns in Climate Change. Ferenc L. Tóth, editor. 1999. 224 pp. £16.95, plus £8.50 shipping. To order a copy, contact Earthscan, 120 Pentonville Road, London N1 9JN, U.K.; tel: +44 (0) 20 7278 0433; fax: +44 (0) 20 7278 1142; WWW: www.earthscan.co.uk.

Weather America: A Thirty-Year Summary of Statistical Weather Data and Rankings. 2001. 2,020 pp. \$175.00. Copies can be purchased from Grey House Publishing, 185 Millerton Road, P.O. Box 860, Millerton, NY 12546; (800) 562-2139; WWW: www.greyhouse.com.

This hefty tome provides extensive climatological data for over 4,000 locations (states, counties, cities, and towns) throughout the United States. It contains lists of major storms, maximum and minimum temperatures, precipitation, snowfall, fog, humidity, and wind speed. The largest section of *Weather America* is organized into 50 state subsections. Each state listing contains a city index to help the user locate the nearest weather station to the city or county they are researching, narrative descriptions of climatic conditions for each state, and detailed statistical data from local weather stations, covering maximum and minimum temperatures, number of foggy days, humidity, wind speed, and much more.

Office of U.S. Foreign Disaster Assistance Annual Report FY 2000. 2001. 94 pp. Free. To request a copy, contact the U.S. Agency for International Development, Ronald Reagan Building, 1300 Pennsylvania Avenue, N.W., BIIR/OFDA 8.06.01M, Washington, DC 20523-8602; (202) 712-0400; fax: (202) 216-3706.

In addition to summaries of OFDA activities for the past year, this volume contains articles describing how the U.S. government provides humanitarian aid and discussing environmental degradation and disasters. The report also provides data regarding specific disasters and complex emergencies by country.

Floods and Sea Level Rise

Mississippi Floods: Designing a Shifting Landscape. Anuradha Mathur and Dilip da Cunha. 2001. 224 pp. \$45.00. Copies are available from Yale University Press, Order Department, P.O. Box 209040, New Haven, CT 06520; (800) 987-7323; fax: (800) 777-9253; e-mail: custservice.press@yale.edu; WWW: www.yale.edu/yup.

The "design" of the Mississippi River has long been a subject of controversy. What is missing from the discussion, say the authors of this book, is an understanding of the "representations" of the Mississippi River. Landscape architect Anuradha Mathur and architect/planner Dilip da Cunha draw together an array of perspectives on the river and show how these different images have played a role in the process of designing and containing the river landscape. Analyzing maps, hydrographs, working models, drawings, photographs, government and media reports, paintings, and even folklore, Mathur and da Cunha consider what these representations of the river portray, what they leave out, and why. In short, the authors, in their own words, "resolved to set out on a journey, naively perhaps, to re-engage the Mississippi, not as an object, but as a dynamic, living phenomenon that asserts its own dimensions."

Wetlands Protection: Assessments Needed to Determine Effectiveness of In-Lieu-Fee Mitigation. Report No. GAO-01-325. 2001. 75 pp. Free. Copies are available from the U.S. General Accounting Office (GAO), P.O. Box 37050, Washington, DC 20013; (202) 512-6000; e-mail: info@www.gao.gov; WWW: www.gao.gov.

America is losing its wetlands at an increasing rate, primarily due to agriculture and development. GAO investigators say federal programs to stem the losses are having uncertain results. Of an estimated 220 million acres of marshes, bogs, swamps, and other wetlands in the contiguous U.S. during colonial times, over half have disappeared or have been degraded. Wetlands perform important ecological functions, including abating floods, maintaining water quality, and providing habitat for fish and wildlife. Provisions in the Clean Water Act require protection and replacement of wetlands. This report evaluates the U.S. Army Corps of Engineers program that allows developers to pay fees to public entities or private nonprofit natural resources management organizations (called in-lieu fees) to establish and/or replace wetlands.

Compensating for Wetland Losses Under the Clean Water Act. Committee on Mitigating Wetland Losses, Board on Environmental Studies and Toxicology, Water Science and Technology Board, National Research Council. 2001. 320 pp. \$42.95, hardcover; \$48.00, prepublication version. To order a copy, contact the National Academy Press, 2101 Constitution Avenue, N.W., Lockbox 285, Washington, DC 20055; (888) 624-8373 or (202) 334-3313; WWW: www.nap.edu/catalog/10134.htm. On-line orders receive a 20% discount.

Wetlands function as natural sponges that trap and slowly release surface water, rain, snowmelt, groundwater, and flood waters. Trees, root mats, and other wetland vegetation also slow the speed of flood waters and distribute them more slowly over the floodplain. This combined water storage and braking action lowers flood heights and reduces erosion. Wetlands also help prevent waterlogging of crops, reduce shoreline erosion, improve water quality, and diminish drought impacts. This volume contains the report of a scientific committee appointed by the National Academy of Sciences to evaluate the federal programs that deal with wetland preservation; it was funded by the Environmental Protection Agency, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service. The panel concluded that, before granting permits to fill natural wetlands, regulators should give greater consideration to how restored or newly created wetlands can replicate the ecological functions of naturally occurring wetlands and become a sustainable part of the larger watershed. Wetlands within and downstream of urban areas are particularly valuable, counteracting the greatly increased rate and volume of surface-water runoff from pavement and buildings. Preserving and restoring wetlands, together with other water retention measures, can often provide the level of flood control otherwise produced by expensive dredge operations and levees.

Hurricanes

Living on the Edge of the Gulf: The West Florida and Alabama Coast. David M. Bush, Norma J. Longo, William J. Neal, Luciana S. Esteves, Orrin H. Pilkey, Deborah F. Pilkey, and Craig A. Webb. 2001. 350 pp. \$22.95. This volume can be purchased from Books Fulfillment, Duke University Press, Box 90660, Durham, NC 27708-0660; (888) 651-0122; fax: (919) 688-2615 or (888) 651-0124; WWW: dukeupress.edu.

The Gulf Coast along Florida and Alabama is a fragile combination of barrier islands, low-lying marshes, and highly erodible mainland shores. In addition to sea-level rise, winter storms, and altered sediment supplies, hurricanes frequently damage or destroy the human developments and infrastructure that line this coast. Indeed, a single storm can cause billions of dollars in losses. The authors of *Living on the Edge of the Gulf* seek to counteract potential loss by providing an introduction to coastal processes, a history of hazards for the region, and risk-reduction guidance in the form of site evaluations, and descriptions of community mitigation techniques and storm-resistant construction practices. The book's risk maps that focus on individual coastal beaches are designed to assist property owners, community planners, and other officials in prudent decision making, while a review of coastal regulations is intended to help owners to understand and navigate various permit requirements. This book is one of the nearly 20 volumes in the "Living with the Shore" series. Eventually, there will be a book for each coastal state as well as for Lake Erie and Lake Michigan. Funding for the series has been provided by the NOAA Office of Coastal Zone Management, the North Carolina Sea Grant Program, the Federal Emergency Management Agency, and others.

Hurricane Andrew: Ethnicity, Gender, and the Sociology of Disasters. Walter Gillis Peacock, Betty Hearn Morrow, and Hugh Gladwin. 1997. 304 pp. \$20.00, plus \$2.00 shipping. Florida residents, add 6% sales tax. Paperback copies of this volume (see the *Observer*, Vol. XXII, No. 3, p. 21) can now be obtained by contacting the International Hurricane Center, Hurricane Andrew Book, Florida International University, Miami, FL 33199; (305) 348-1607; WWW: www.ihc.fiu.edu.

Lessons Learned Regarding the Use of Spatial Data and Geographic Information Systems (GIS) During Hurricane Floyd. 2001. 50 pp. Free. Copies are available from the National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center web site: www.scs.noaa.gov/hfloyd.

This report assesses both the positive and problematic aspects of using spatial data and geographic information systems (GIS) in response and recovery efforts during Hurricane Floyd.

Seeking Authors for Sequel to *What Is a Disaster*

In 1997 hazards researcher Henry Quarantelli compiled and edited a dozen articles into the book, *What Is A Disaster? Perspectives on the Question*. The authors represented six different social science disciplines as well as six different countries.

Quarantelli is now planning to put together a more up-to-date volume, *What Is A Disaster, More Perspectives*, to be published in 2004, and he is seeking possible chapter authors. Although he has enough contributors from Western countries, he is still looking for authors from non-Western societies and cultures. Persons interested in contributing to this proposed volume should contact E.L. Quarantelli, Disaster Research Center, University of Delaware, Newark, DE 19716; (302) 831-6618; fax: (302) 831-2091; e-mail: elqdrc@udel.edu.

Pacific Health Dialog Seeks Authors for Special Issue on Emergency Environmental Health

The Centers for Disease Control and Prevention (CDC) Emergency Preparedness and Response Branch and the *Pacific Health Dialog* journal have announced sponsorship of a special issue of *Pacific Health Dialog* dedicated to issues of "Emergency Environmental Health" in the Pacific Region, including health issues related to natural and technological disasters, risk and emergency management, emergency medical services, water and food safety, emergency operation planning, hazard identification, mitigation, emergency response, and disaster epidemiology.

The editor of *Pacific Health Dialog* is now calling for papers, articles, reviews, letters, and other material. The issue is scheduled for 2002, so contributions should be submitted as soon as possible. For submission information, see www.resourcebooks.co.nz/phd/phd.htm. Questions can also be directed to the editor, Mark Keim, CDC, Department of Health and Human Services; (770) 488-4597; fax: (770) 488-4820.

Electronic Fare

A New Beginning in a New Millennium. Proceedings of the 24th Annual Conference of the Association of State Floodplain Managers (ASFPM). Austin, Texas, June 18-23, 2000. CD-ROM. \$20.00, members; \$25.00, nonmembers; plus \$5.00 shipping. The CD can be purchased from the ASFPM, 2809 Fish Hatchery Road, Suite 204, Madison, WI 53713-3120; (608) 274-0123; fax: (608) 274-0696; e-mail: aspm@floods.org; WWW: www.floods.org.

The theme for last year's ASFPM annual meeting was "Floodplain Management: 2000 and Beyond." The technical papers presented at the conference and collected on this disk, address topics such as federal agency programs in floodplain management, innovative state and local activities, sustainable floodplains, regional approaches to flood risk, the natural and cultural benefits of floodplains, acquisition programs, stormwater management, coastal issues, flood estimation and prediction, mapping, modeling, and new technology.

Coastal Vulnerability to Sea-Level Rise: A Preliminary Database for the U.S. Atlantic, Pacific, and Gulf of Mexico Coasts. Erika Mannar-Klose and E.R. Thieler. Report No. DDS-0068. CD-ROM. 2001. \$32.00. To obtain a copy, contact the U.S. Geological Survey, Information Service, Box 25286, Federal Center, Denver, CO 80225; (888) 275-8747; WWW: mapping.usgs.gov.

The prediction of coastal evolution is not straightforward. There is no standard methodology, and even the kind of data required to make such predictions is the subject of much scientific debate. Since a viable, quantitative predictive model for coastal evolution is not available, the relative susceptibility of the nation's coastline to sea-level rise is quantified here at a regional to national scale using basic information regarding coastal geomorphology, rate of sea-level rise, past shoreline evolution, and other factors. This approach combines the coastal system's susceptibility to change with its natural ability to adapt to changing environmental conditions and yields a relative measure of the system's natural vulnerability to the effects of sea-level rise. This information has immediate application to many decisions related to coastal development in both the short and long term.

Emergency Resource Management Application (ERMA). Software. \$295.00. The program is available from Emergency Management Concepts, 2509 Klondike Court, Missoula, MT 59808; e-mail: info@emconcepts.net; WWW: www.emconcepts.net/erma.htm.

This program provides a method for tracking community resources during an emergency. ERMA offers several sort functions, allowing the user to classify resources by agency, incident type, resource type, and other factors, as well as to track their location and availability.

THE HAZARDS CENTER

The NATURAL HAZARDS RESEARCH AND APPLICATIONS INFORMATION CENTER was founded to strengthen communication among researchers and the individuals and organizations concerned with mitigating natural disasters. The center is funded by the National Science Foundation, Federal Emergency Management Agency, National Oceanic and Atmospheric Administration, U.S. Geological Survey, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Department of Transportation, U.S. Bureau of Reclamation, National Aeronautics and Space Administration, the Institute for Business and Home Safety, and the Public Entity Risk Institute. Please send information of potential interest to the readers of this newsletter to the address below. The deadline for the next *Observer* is September 21, 2001.

Center phone number (303) 492-6818
Fax (303) 492-2151
E-mail hazctr@spot.colorado.edu
Publications Administrator (303) 492-6819
E-mail janet.kroeckel@colorado.edu

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Institute of Behavioral Science #6

University of Colorado at Boulder

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